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MARCOR REMEDIATION, INC.
HEALTH AND SAFETY PLAN
VERSION 1.1

SCREENING PLANT
OPERABLE UNIT 02
LIBBY, MT

Microscopic view of fibrous bundle in vermiculite
From the EPA website for Libby, Montana

Developed under contract no. DTRS57-96-D-00036, USDOT VOLPE
Developed by: Dan Figueroa, MARCOR Remediation, Inc.

Reviewed by: Bruce Lippy, CIH, CSP _____ 7-15-00 (date)

Seal

Procedure Number: 05-501-02

Procedure Name: Asbestos Abatement

Effective Date: 10-09-96

Supersedes Procedure Number: 05-501-01

Responsible Positions: General Managers, Operations Managers, Supervisors

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Objective: To establish standard operating procedures to be used for asbestos abatement.

GENERAL

All abatement procedures utilized shall meet at a minimum:

- Guidance for Controlling Asbestos - Containing Materials in Buildings published by The Environmental Protection Agency.
- Title 40, C.F.R. Part 61, Subparts A & M (U.S. EPA) National Emissions Standard for Hazardous Air Pollutants (NESHAP)
- Title 29, C.F.R. Sec. 1910.1001 (OSHA)
- Title 29, C.F.R. Sec. 1926.1101 (OSHA)
- Asbestos Hazard Emergency Response Act (AHERA)
- MARCOR's S.O.P. for Respiratory Protection (02-101-01)
- MARCOR's guidelines for Safe Work Practices (02-301-01)
- MARCOR's S.O.P. for Confined Space Entry (02-120-01)
- State/Local regulations, should they be more stringent than the above

DEFINITIONS

Aggressive method - means removal or disturbance of building material by sanding, abrading, grinding or other method that breaks, crumbles, or disintegrates intact ACM.

Amended water - means water to which surfactant (wetting agent) has been added to increase the ability of the liquid to penetrate ACM.

Asbestos - includes chrysotile, amosite, crocidolite, tremolite asbestos, anthophyllite asbestos, actinolite asbestos, and any of these minerals that has been chemically treated and/or altered or for the purpose of this policy, Presumed Asbestos Containing Material.

Asbestos-containing material (ACM) - means any material containing more than one percent asbestos.

Authorized Personnel - means any person authorized by MARCOR and required by work duties to be present in a regulated work area.

Building/facility owner - is the legal entity, including a lessee, which exercises control over management and record keeping functions relating to a building and/or facility in which activities covered by this standard take place.

Certified Industrial Hygienist (CIH) - means one certified in the practice of industrial hygiene by the American Board of Industrial Hygiene.

Class I asbestos work - means activities involving the removal of TSI and surfacing ACM and PACM.

Class II asbestos work - means activities involving the removal of ACM which is not thermal system insulation or surfacing material. This includes, but is not limited to, the removal of asbestos-containing wallboard, floor tile and sheeting, roofing and siding shingles, and construction mastics.

Class III asbestos work - means repair and maintenance operations, where "ACM", including TSI and surfacing ACM and PACM, is likely to be disturbed.

Class IV asbestos work means - maintenance and custodial activities during which employees contact but do not disturb ACM or PACM and activities to clean up dust, waste and debris resulting from Class I, II, and III activities.

Clean room - means an uncontaminated room having facilities for the storage of employees' street clothing and uncontaminated materials and equipment.

Critical barrier - means one or more layers of plastic sealed over all openings into a work area or any other similarly placed physical barrier sufficient to prevent airborne asbestos in a work area from migrating to an adjacent area.

Decontamination area - means an enclosed area adjacent and connected to the regulated area and consisting of an equipment room, shower area, and clean room, which is used for the decontamination of employees, materials, and equipment that are contaminated with asbestos.

Demolition - means the wrecking or taking out of any load-supporting structural member and any related razing, removing, or stripping of asbestos products.

Disturbance - means activities that disrupt the matrix of ACM or PACM, crumble or pulverize ACM or PACM, or generate visible debris from ACM or PACM. In no event shall the amount of ACM or PACM so disturbed exceed that which can be contained in one glove bag or waste bag which shall not exceed 60 inches in length and width.

Employee exposure - means that exposure to airborne asbestos that would occur if the employee were not using respiratory protective equipment.

Equipment room (change room) - means a contaminated room located within the decontamination area that is supplied with impermeable bags or containers for the disposal of contaminated protective clothing and equipment.

Fiber - means a particulate form of asbestos, 5 micrometers or longer, with a length-to-diameter ratio of at least 3 to 1.

Glovebag - means not more than a 60 x 60 inch impervious plastic bag-like enclosure affixed around an asbestos-containing material, with glove-like appendages through which material and tools may be handled.

High-efficiency particulate air (HEPA) filter - means a filter capable of trapping and retaining at least 99.97 percent of all mono-dispersed particles of 0.3 micrometers in diameter.

Homogeneous area - means an area of surfacing material or thermal system insulation that is uniform in color and texture.

Industrial hygienist - means a professional qualified by education, training, and experience to anticipate, recognize, evaluate and develop controls for occupational health hazards.

Intact - means that the ACM has not crumbled, been pulverized, or otherwise deteriorated so that the asbestos is no longer likely to be bound with its matrix.

ACM - means "presumed asbestos containing material". Presumed Asbestos Containing Material

means thermal system insulation and surfacing material found in buildings constructed no later than 1980.

Regulated area - means an area demarcated by MARCOR where Class I, II, and III asbestos work is conducted, and any adjoining area where debris and waste from abatement accumulate; and a work area within which airborne concentrations of asbestos, exceed or there is a reasonable possibility they may exceed the permissible exposure limit (PEL).

Removal - means all operations where ACM and/or PACM is taken out or stripped from structures or substrates, and includes demolition operations.

Renovation - means the modifying of any existing structure, or portion of it.

Repair - means overhauling, rebuilding, reconstructing, or reconditioning structures or substrates, including encapsulation or other repair of ACM or PACM attached to structures or substrates.

Surfacing material - means material that is sprayed, troweled-on or otherwise applied to surfaces (such as acoustical plaster on ceilings and fireproofing materials on structural members, or other materials on surfaces for acoustical, fireproofing, and other purposes). Surfacing ACM is surfacing material which contains more than 1% asbestos.

Thermal system insulation (TSI) - means ACM applied to pipes, fittings, boilers, breeching, tanks, ducts or other structural components to prevent heat loss or gain. Thermal system insulation ACM is thermal system insulation which contains more than 1% asbestos.

EXPOSURE ASSESSMENTS AND MONITORING

1) Time-weighted Average Limit (TWA)

No employee shall be exposed to an airborne concentration of asbestos in excess of .1 0 fiber per cubic centimeter of air (f/cc) as an 8 hour time-weighted average (TWA).

2) Excursion Limit

No employee shall be exposed to an airborne concentration of asbestos in excess of 1.0 f/cc as averaged over a sampling period of 30 minutes.

Personal air samples shall be taken from the breathing zone and be representative of the 8-hour TWA of each employee in the area for the work shift performing the same job functions. One cassette used to sample for personal exposure monitoring should be taken for 30 minutes during peak exposure and

analyzed independently as an excursion measurement as well as part of the 8 hour TWA for the personal exposure measurement. Samples shall be taken in accordance with 29 CFR 1926.1101 and MARCOR policy # 02-101-04, Respiratory Protection - Asbestos.

REGULATED AREAS

All Class I, II, and III asbestos abatement work shall be conducted within regulated areas. The Project Manager is responsible for notifying the state and federal regulatory agencies of the project.

1) Demarcation

Regulated work areas shall be delineated in a manner that ensures only skilled, trained, authorized and regularly employed personnel will have access to the work area and protects persons outside the area from exposure to airborne asbestos. Critical barriers or negative pressure enclosures may be used to demarcate the area.

Prior to the start of the project, the required asbestos notification signs shall be posted. Warning signs shall be posted at such a distance from the location that they may be read and the necessary protective steps taken before entering the area marked by the signs. The signs shall read as follows:

DANGER

ASBESTOS

CANCER AND LUNG DISEASE HAZARD

AUTHORIZED PERSONNEL ONLY

RESPIRATORS AND PROTECTIVE CLOTHING ARE REQUIRED IN THIS AREA

2) Personnel Protection

All participating personnel will have received medical screening and will have been physician certified to work while wearing a respirator in accordance with MARCOR policy # 06-132, Medical Surveillance - Asbestos, and 29 CFR 1926.1101 (m). All participating personnel will have successfully completed a state approved training course in accordance with 29 CFR 1926.1101 (k) and MARCOR policy # 05-301, Training - Asbestos. Training facilities, dates, and

MARCOR policy # 05-301, Training - Asbestos. Training facilities, dates, and control numbers are available for the customer upon request.

All personnel within the regulated work area, without exception, will wear NIOSH approved repiratory protection and disposable clothing from head to foot. Respirators shall be selected and used in accordance with 29 CFR 1926.1101 (h) and MARCOR policy # 02-101, Respiratory Protection - Asbestos.

Other protective equipment available and often used by personnel within the work area include but is not limited to:

- Safety glasses
- hard hats
- non-slip PVC footwear
- hearing protection
- disposable gloves
- cool vests
- safety harnesses, lanyards, and lines
- ground fault circuit interrupters

3) Prohibited Activities

Employees are not permitted to eat, drink, smoke, chew tobacco or gum, or apply cosmetics in the regulated work area.

4) Project Supervision

All asbestos abatement projects performed in regulated areas shall be supervised by a MARCOR supervisor and competent person as defined in 40 CFR part 763.

5) Decontamination

consisting of an equipment room, shower, and clean room. Employees shall enter and exit the regulated area through the decontamination area.

The equipment room shall contain impermeable labeled bags and containers for disposal of contaminated protective equipment.

Shower facilities shall be adjacent to both the equipment room and the clean room unless work is performed outdoors. In which case, asbestos contamination should be removed from the worksuit in the equipment room using a HEPA vacuum before proceeding to a shower that is not adjacent to the work area. See MARCOR policy #- for more information about worker decontamination.

WORK PRACTICES - CLASS I ASBESTOS ABATEMENT

Vacuum cleaners equipped with HEPA filters to collect ACM and PACM debris and dust shall be used.

Asbestos material shall be "misted" with amended water to control aerosolizing of the fibers which may include wetting fibers through to the substrate. The material shall also be intermittently misted during actual removal to keep fiber levels down. Materials are removed in sections and placed in 6 mil plastic bags which are sealed, appropriately labeled and readied for disposal. Asbestos material is kept wet prior to bagging. Occasionally, situations and type of materials or specifications call for the bagged material to be placed within sealed drums. In either case, bags and drums are wiped down prior to removal from the work area and disposal.

Additionally, the following control methods shall be used in conjunction with respiratory protection in compliance with 29 CFR 1926.1101 (h).

1) Local exhaust ventilation equipped with HEPA filter dust collection systems;

2) Enclosure or isolation of processes producing asbestos dust.

3) Ventilation of the regulated area to move contaminated air away from the breathing zone of employees and toward a filtration or collection device equipped with a HEPA filter

4) Placement of critical barriers over all the openings to the regulated area, except where activities are performed outdoors; or the use of another barrier or isolation method which prevents the migration of airborne asbestos from the regulated area,

as verified by perimeter area surveillance during each work shift at each boundary of the regulated area, showing no visible asbestos dust; and perimeter area monitoring showing that clearance levels contained in 40 CFR part 763, subpt. E, of the EPA Asbestos in Schools Rule are met, or that perimeter area levels, measured by Phase Contrast Microscopy (PCM) are no more than background levels representing the same area before the asbestos work began.

5) Isolation of HVAC systems in the regulated area by sealing with a double layer of 6 mil plastic or the equivalent

6) Placement of impermeable dropcloths on surfaces beneath all removal activity

7) Covering of all objects in the regulated area with impermeable dropcloths or plastic sheeting which is secured by duct tape.

8) Construction and use of Negative Pressure Enclosure (NPE) systems unless the configuration of the work area makes erection of the enclosure infeasible. The NPE enclosure shall be erected in accordance with 29 CFR 1926.1101 (g).

   a) Before beginning work within the enclosure and at the beginning of each shift, the NPE shall be inspected for breaches and smoke-tested for leaks, and any leaks sealed.

   b) Electrical circuits in the enclosure shall be deactivated, unless equipped with ground-fault circuit interrupters (GFCI).

9) Glove bag and Negative Pressure Glove Box systems may be used to remove PACM and/or ACM from straight runs of piping and elbows and other connections provided more stringent state laws do not preclude the use of these systems and the specifications and work practices found in 29 CFR 1926.1101 (g) are followed. See MARCOR policy #05-502, Glove bagging.

The following work practices and engineering controls are **prohibited** for work related to asbestos or for work which disturbs ACM or PACM, regardless of measured levels of asbestos exposure or the results of initial exposure assessments:

1) High-speed abrasive disc saws that are not equipped with point of cut ventilator or enclosures with HEPA filtered exhaust air.

2) Compressed air used to remove asbestos, or materials containing asbestos, unless

the compressed air is used in conjunction with an enclosed ventilation system designed to capture the dust cloud created by the compressed air.

3) Dry sweeping, shoveling or other dry clean-up of dust and debris containing ACM and PACM.

4) Employee rotation as a means of reducing employee exposure to asbestos.

WORK PRACTICES - CLASS II ASBESTOS ABATEMENT

For indoor removal of ACM which is not thermal system insulation or surfacing material such as asbestos-containing floor tile when job conditions indicate there may be exposure above the PEL or removal of ACM in a substantially intact state is not possible, the following methods shall be used:

1) Critical barriers shall be placed over all openings to the regulated area

2) Impermeable dropcloths shall be placed on surfaces beneath all removal activity

3) Vacuum cleaners equipped with HEPA filters to collect ACM and PACM debris and dust shall be used.

Asbestos material shall be "misted" with amended water to control aerosolizing of the fibers which may include wetting fibers through to the substrate. The material shall also be intermittently misted during actual removal to keep fiber levels down. Materials are removed in sections and placed in 6 mil plastic bags which are sealed or wrapped in plastic sheeting and placed in a closed receptacle, appropriately labeled and readied for disposal. Asbestos material is kept wet prior to bagging. Occasionally, situations and type of materials or specifications call for the bagged material to be placed within sealed drums. In either case, bags and drums are wiped down prior to removal from the work area and disposal

The following work practices should be followed in addition to those cited above:

Vinyl and Asphalt Flooring Materials

For removing vinyl and asphalt flooring materials which contain ACM or for which were constructed no later than 1980 and the owner has not verified the absence of ACM, the following work practices shall be used:

1) Flooring or its backing shall not be sanded.

2) Vacuums equipped with HEPA filter, disposable dust bag, and metal floor tool (no brush) shall be used to clean floors.

3) Resilient sheeting shall be removed by cutting with wetting of the snip point and wetting during decontamination. Rip-up of resilient sheet floor material is prohibited.

4) All scraping of residual adhesive and/or backing shall be performed using wet methods.

5) Dry sweeping is prohibited.

6) Mechanical chipping is prohibited unless performed in a negative pressure enclosure.

7) Tiles shall be removed intact, unless it is demonstrated that intact removal is not possible.

8) When tiles are heated and can be removed intact, wetting may be omitted.

Roofing Materials

For removing roofing materials containing ACM the following additional work practices shall be used:

1) Roofing material shall be removed in an intact state to the extent feasible.

2) Wet methods shall be used to remove roofing materials that are not intact, or that will be rendered not intact during removal, unless such wet methods are not feasible or will create safety hazards.

3) Cutting machines shall be continuously misted during use, unless a competent person determines that misting substantially decreases worker safety.

4) When removing built-up roofs with asbestos-containing roofing felts and an aggregate surface using a power roof cutter, all dust resulting from the cutting operation shall be collected by a HEPA dust collector, or shall be HEPA vacuumed by vacuuming along the cut line, or by gently sweeping and then

carefully and completely wiping up the still-wet dust and debris left along the cut line. The dust and debris shall be immediately bagged or placed in covered containers.

5) Do not drop or throw ACM that has been removed from a roof to the ground. Unless the material is carried or passed to the ground by hand, it must be lowered to the ground via a covered, dust-tight chute, crane or hoist as soon as practicable, but no later than at the end of the work shift.

6) Any ACM that is not intact shall be lowered to the ground as soon as is practicable, but in any event no later than the end of the work shift. While the material remains on the roof it shall either be kept wet, placed in an impermeable waste bag, or wrapped in plastic sheeting.

7) Upon being lowered, unwrapped material shall be transferred to a closed receptacle in such manner so as to preclude the dispersion of dust.

8) Roof level heating and ventilation air intake sources shall be isolated or the ventilation system shall be shut down.

Cementitious ACM Siding, Shingles or Transite Panels

When removing cementitious asbestos-containing siding and shingles or transite panels containing ACM on building exteriors other than roofs, the following work practices shall be followed:

1) Cutting, abrading or breaking is prohibited unless it can be demonstrated that methods less likely to result in fiber release cannot be used.

2) Each panel shall be sprayed with amended water prior to removal.

3) Unwrapped or unbagged panels or shingles will be immediately lowered to the ground via covered dust-tight chute, crane or hoist, or placed in an impervious waste bag or wrapped in plastic sheeting and lowered to the ground no later than the end of the work shift.

4) Nails shall be cut with flat, sharp instruments.

ACM Gaskets

When removing gaskets containing ACM, the following work practices shall be followed:

1) If a gasket is visibly deteriorated and unlikely to be removed intact, removal shall accomplished within a glovebag in accordance with MARCOR policy #05-502, Glove Bags and 29 CFR 1926.1101 (g).

2) The gasket shall be thoroughly wetted with amended water prior to its removal.

3) The wet gasket shall be immediately placed in a disposal container.

4) Any scraping to remove residue must be performed wet.

CLASS III ASBESTOS WORK

If performing maintenance and repair operations where ACM is likely to be disturbed, asbestos work shall be conducted using work practices in accordance with 29 CFR 1926.1101 (g). Work shall be performed while keeping material wet and using a local exhaust ventilation to the extent feasible.

EQUIPMENT AND MATERIALS USED

All equipment and materials used by MARCOR will be suitable for asbestos abatement work. Documentation concerning the equipment and materials available to the customer upon request.

Equipment normally used by MARCOR includes, but is not limited to:

1. Portable HEPA filtered air filtration systems, providing 0.3 micron particle removal at 99.97% retention to be used.

2. HEPA equipped vacuums, providing 0.3 micron particle removal at 99.97% retention to be used on all projects.

3. Airless encapsulation sprayers to be used as required. Post removal encapsulation will be performed on all spray-on fireproofing removal projects.

4. Ground fault circuit interrupters to be used on all non-grounded

equipment.

5. Supplied air respirators with full face masks to be used when required.

6. Powered air purifying respirators (PAPR) with full face masks to be used, as a minimum, for all projects during abatement activities.

7. Air purifying respirators to be used when risk of exposure is minimal (i.e. set-up, tear-down, disposal, etc.)

8. Cool vests to be used when required.

9. Decontamination showers.

10. PVC braced decontamination air locks

Materials normally used by MARCOR include but are not limited to:

1. 6 mil polyethylene sheeting and bags - minimum thickness

2. bridging and penetrating encapsulant

3. surfactant (wetting agent)

4. duct tape - suitable for hanging polyethylene

5. spray adhesive

6. protective coveralls

TECHNICAL ASSISTANCE

For personnel health & safety, MARCOR will utilize the services of a Certified Industrial Hygienist as well as our Health & Safety Coordinator who work in concert with several Occupational Health Facilities, laboratories and other professionals to administrate a sound and effective safety program.

For environmental protection MARCOR requires, if practical, that air samples should be analyzed by a laboratory.

- The laboratory must be accredited by the American Industrial Hygiene Association (AIHA) for asbestos analysis.

- If phase contrast microscopy services are required, it is required that the microscopist of the laboratory has successfully completed the NIOSH 582 course "Sampling and Evaluation of Airborne Asbestos Dust" or equivalent and is an active participant in the NIOSH Proficiency Analytical Testing (PAT) program for asbestos or on the AIHA Asbestos Registry. The microscopist's analysis of the PAT round samples must be within one standard deviation of the published mean. The PAT data must apply specifically to the microscopist, not the laboratory in general, and must represent the most recent PAT round.

- If bulk sample asbestos analysis is required, the laboratory must also be accredited through the National Institute of Standards & Technologies (NIST) National Voluntary Lab Accreditation Program (NVLAP) for Asbestos Fiber Analysis of Bulk Materials. Laboratory must maintain appropriate certification status throughout the duration of the project. PLM analysis of bulk samples must be performed by an analyst who has had formal training by the McCrone Research Institute for bulk analysis or equivalent training. The PLM analyst must have at least six (6) months analytical experience.

- If TEM analysis is required, the laboratory must be registered to participate in the NVLAP's TEM Accreditation Program and must have final acceptance by the NVLAP for TEM accreditation.

Additional air sampling of areas adjacent to the work area and areas cleaned for re-occupancy should be performed to determine if the barrier systems and decontamination procedures were adequate in preventing airborne concentrations of asbestos fibers. A visual inspection of the cleaned work area will be conducted in order for the work area to be declared suitable for re-occupancy. The following criteria shall be met prior to re-occupancy:

- there is no visible dust or debris;
- final air quality documented is no greater than .01 F/CC; or final air quality documented does not exceed pre-existing fiber levels documented prior abatement procedures.

CLEAN UP

When all visible material is removed and/or encapsulated, polyethylene is removed from floors and walls. All windows, doors, and vents remain sealed and any air filtration units are left functioning. All surfaces within the work area are then wet-cleaned and/or vacuumed. Upon completion of the final cleaning a visual inspection is performed to ensure that the area is free of visible debris. Next, air samples are taken to further ensure complete decontamination. If air samples prove to be unsatisfactory, the cleaning process and air samples are repeated until satisfactory results are achieved.

When satisfactory air results are achieved, the decontamination enclosure, as well as any remaining essential enclosures, are thoroughly cleaned and disposed of as contaminated waste.

A final check of the work area is effected to determine whether dismantling procedures have left any dust or debris. The clean area is then turned over to the customer with proper documentation.

DISPOSAL

As work progresses and to prevent exceeding available storage capacity, sealed and properly labeled containers of asbestos waste are wet cleaned and/or vacuumed and removed from the storage enclosure. This requires the use of at least two men, one fully suited in disposable garments and respirator within the enclosure who passes the sealed waste through a curtained doorway to another man outside fully suited in disposable garments and respirator.

Asbestos waste will be transferred to an approved landfill.

Disposal must be done in compliance with MARCOR Procedure #05-570 on Transportation of Waste and #05-572 on Waste Management.

RECORDKEEPING

Records of exposure monitoring and medical surveillance shall be maintained for 30 years plus the period of employment in accordance with OSHA requirements. Records of respiratory fit tests shall be maintained for a minimum of 3 years in accordance with OSHA recordkeeping requirements.